POS58III
Line Thermal Printer

User’s Manual

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Chapter 1 Feature and Performance

1.1 Print Performance

- Print method: direct thermal
- Print paper width: 57.5±0.5mm
- Print density: 8 dots/mm, 384 dots/line
- Print speed: approx. 60mm / sec.
- Reliability:
  Print head life: 100km
  Using condition:
  * Print 12 × 24 ASCII characters, print 50 lines each time, intermittent print repeatedly
  * Each dot-line printing at the same time should not exceed 25%, each character-line and one dot vertically printing repeatedly should not exceed 11 times
  * Use specified thermal paper
- Valid print width: 48mm

1.2 Print Paper

● Thermal paper model: TF50KS－E（Japan paper co.ltd）
AF50KS-E(JUJO THERMAL)

● Thermal paper: Width－－－－－－－－－ 57.5±0.5mm
Outer Diameter －－－ 50mm（max.）
Inner Diameter －－－ 13mm（min.）
Thickness －－－－－－－ 53～60g / m^2

1.3 Print Font

- ANK Character set:
  12×24 dots，1.25（W）×3.00（H）mm;
- GB GB2312-80(Chinese):
  24×24 dots，3.00（W）×3.00（H）mm.

1.4 Interface

● Serial interface:
DB25 socket (female), supports XON/XOFF and RTS/CTS protocol.
Baud rate: 1200～115200bps optional.
Data structure: 1 start bit + 8 data bits + 1 stop bit.

● Parallel interface:
DB25 socket (male), 8-bit parallel interface, supports BUSY/ACK handshaking protocol, TTL signal level.
● Ethernet interface:
It can work under the Full-duplex or half-duplex mode and support Ethernet 802.3 protocol, the TCP、UDP、ICMP、IP、ARP、HTTP printing agreement.
● Cash drawer control
DC12V，1A，6-pin RJ-11 socket.

1.5 Print Control Command

● Character print command: supports double width and double height print of ANK characters, user-defined characters and Chinese characters, the character line spacing is adjustable.
● Graphics print command: supports the print of bit map graphics and download bit map graphics with different density
● GS bar code print command: supports EAN-13，EAN-8 bar code print.

1.6 Power Supply

● DC12V±10％，2A，A-1009-3P plug.

1.7 Operation Environment

● Operation temperature: 5～40℃
Relative humidity: 10～80％
● Operation environment temperature: 5～40℃
Relative humidity: 10～80％
● Storage temperature: -20～60℃
Relative humidity: 10～90%

1.8 Outline Dimension

● 138（W）×216（L）×125（H）mm

Chapter 2 Installation and Operation

2.1 Printer Appearance

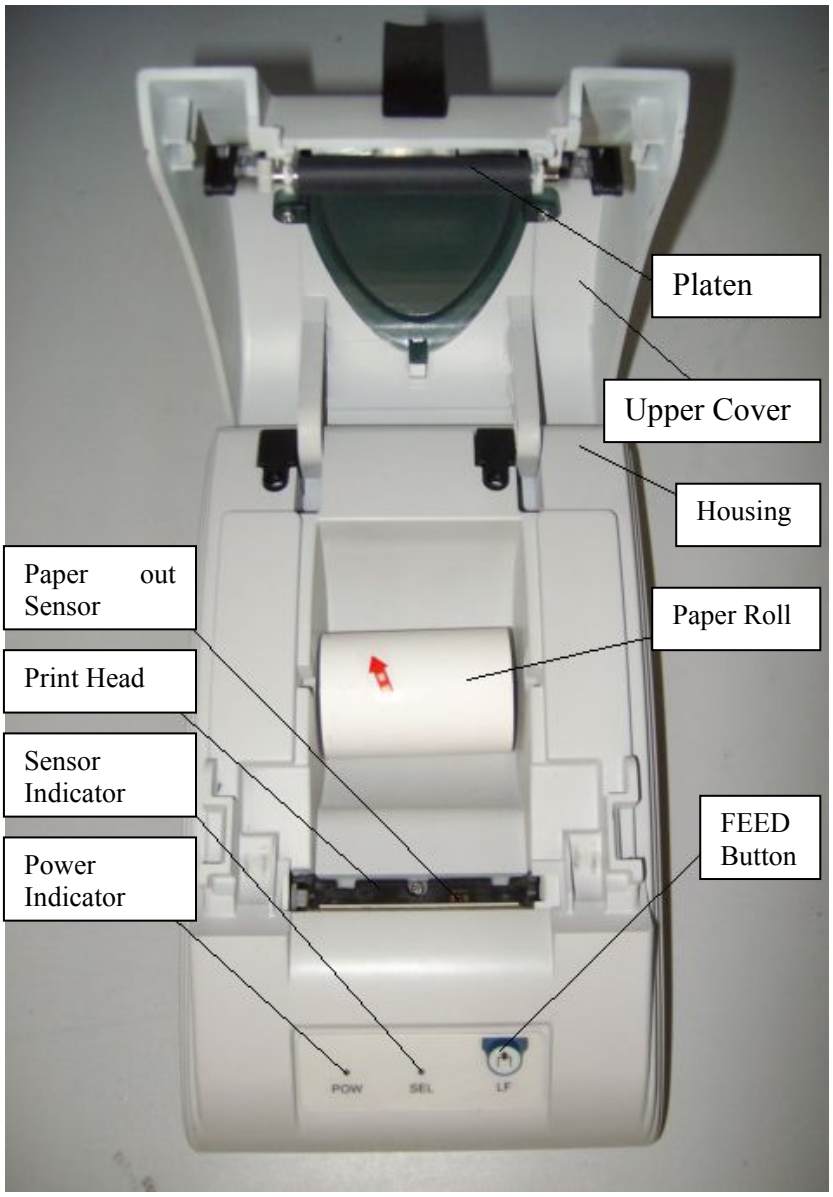


Fig.2-1 Printer Appearance

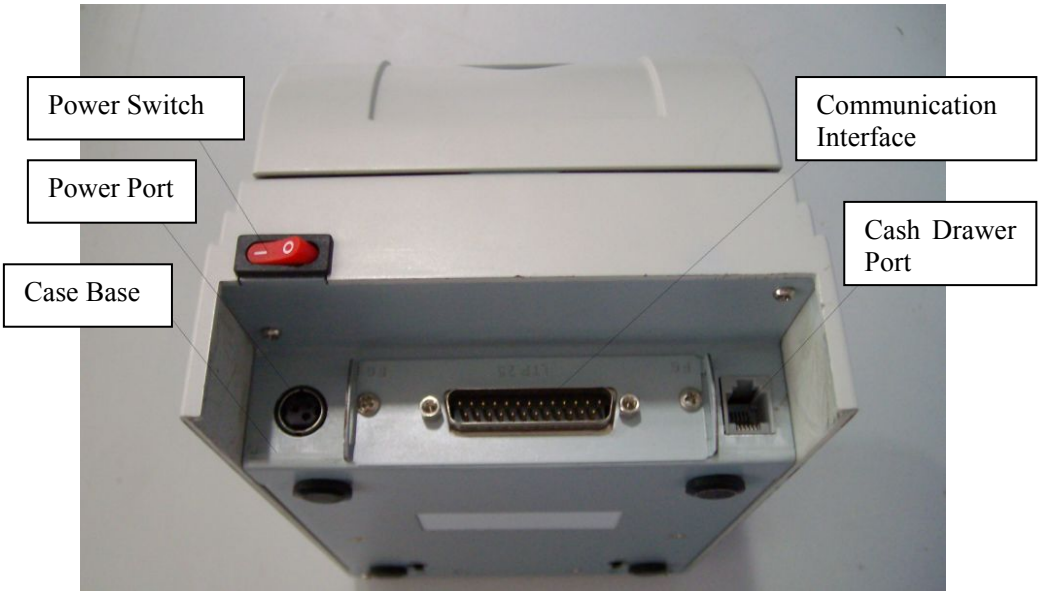


Fig.2-2 Printer Appearance

2.2 Paper Installation

POS58III adopts 57.5±0.5mm width thermal paper.
When there is no paper in the paper case, please don't press【LF】button in case effect the reliability of the print head. As fig. 2-3 shows, uplift the handspike according to the arrowhead direction, in order to open the upper cover door.

Fig.2-3

Please should not use hand to draw the paper ahead or backwards.

2.3 Interface Connection

2.3.1 Serial Interface Connection

The serial interface of POS58III printer is compatible with RS232C standard, supports RTS/CTS handshaking protocol, it uses DB25 socket (female), the pin order of the serial port is as Fig.2-4 shows:

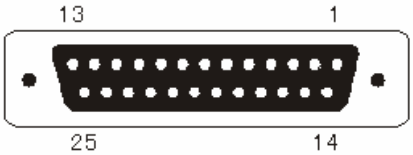


Fig.2-4 Pin Order of the Serial Interface

The pin assignment of serial interface is shown in Fig. 2-5:

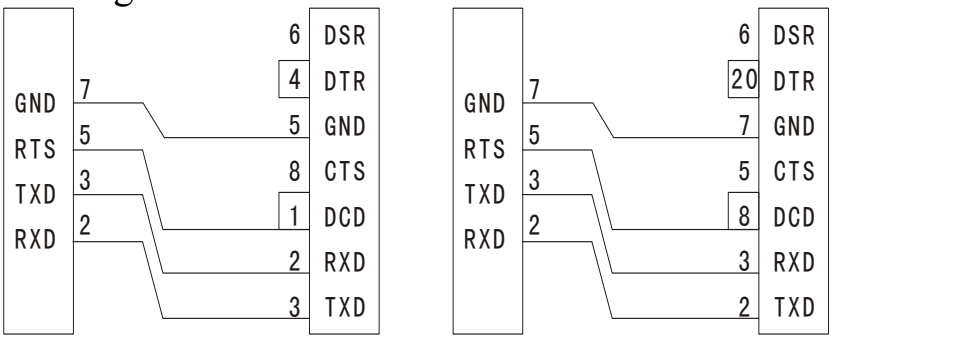
Pin No.	Signal	Source	Description
2	RXD	Host	Printer receives data from host
3	TXD	Printer	Printer transmits data to host
5	CTS	Printer	Signal “MARK” indicates that the printer is “BUSY” and unable to receive data; “SPACE” indicates that the printer is “READY” for receiving data.
6	DSR	Printer	Signal “SPACE” indicates that the printer is “ONLINE”.
7	GND	—	Signal Ground
8	DCD	Printer	Same with CTS

Note: ①“Source” denotes the source that signal comes from;
② Logical signal level is EIA.

Fig.2-5 Pin Assignment of Serial Interface

The baud rate and data structure in serial interface mode are set to 9600bps, 8 data bits, no parity bit and 1 stop bit.

The serial interface of POS58III can be connected to standard RS-232C interface. When connected to IBM PC or compatible machine, connection can accord to Fig.2-6.



Printer 25pin Socket | IBM PC Serial Interface DB-9 | Printer 25pin Socket | IBM PC Serial Interface DB-25

Fig.2-6 Connection between POS58III and IBM PC Serial Interface Sketch Map

2.3.2 Parallel Interface Connection

The parallel interface of POS58III printer is compatible with CENTRONICS, supports BUSY and /ACK handshaking protocol, it uses DB25 socket (male), the pin order of parallel port is as Fig. 2-7 shows:

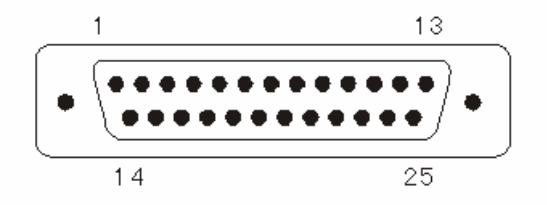


Fig.2-7 Pin Order of Parallel Port

The pin assignment of parallel interface is shown in Fig. 2-8 shows:

Pin No.	Signal	Direction	Description
1	/STB	In	Strobe pulse to latch data, reading occurs at falling edge.
2 3 4 5 6 7 8 9	DATA1 DATA2 DATA3 DATA4 DATA5 DATA6 DATA7 DATA8	In In In In In In In In	These signals represent the 1st bit to 8th bit of the parallel interface data, each signal is at HIGHT level when data is logic 1, and LOW when data is logic 0.
10	/ACK	Out	Answer pulse, LOW level signal indicates that data have already been received and the printer gets ready to receive the next data.
11	BUSY	Out	HIGH level signal indicates that the printer is BUSY and can not receive data.
12	PE	Out	HIGH level signal indicates that paper is end.
13	SEL	Out	Pulling up to HIGH level signal by a resistor indicates the printer is online.
15	/ERR	Out	Pulling up to HIGH level signal by a resistor indicates there is no error.

14,16,17	NC	---	No connection
18-25	GND	---	Grounding logical 0 level

Note: （1）“In” denotes inputting to the printer，“Out” denotes outputting from the printer.

（2）Signal level is TTL standard.

Fig.2-8 Pin Assignment of Parallel Interface

2.3.4 Ethernet Interface

The Ethernet interface accords with IEEE802.3 protocol and supports TCP/IP, ICMP, ARP agreements. It can be used to print internet data. As following fig.2-9 shows:

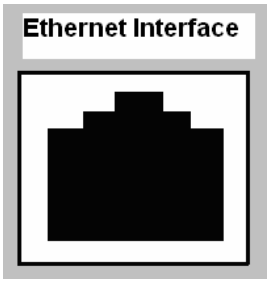


Fig.2-9 Ethernet Interface

2.3.3 Cash Drawer Interface

The cash drawer interface of POS58III adopts RJ-11 6-pin socket, as Fig.2-10 shows:

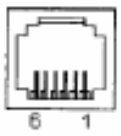


Fig. 2-10 Cash Drawer Interface

The pin assignment of the cash drawer interface is as follows:

Pin No.	Signal	Direction
1	Chassis Ground	---
2	Cash drawer driver signal	Out
3	Cash drawer on/off status signal	In
4	+12V DC	Out
5	N.C	---
6	Cash drawer on/off status signal ground	---

2.3.4 Power Connection

POS58III uses external power supply as 12V, 2A, power socket is A-1009-3P model, as Fig. 2-9 shows:

Fig.2-9 Power Socket

2.4 Buttons and Indicators

Power Switch: control the power on or off status. is power off status, "—" is power on.

FEED Button: hold down the button, paper feeding starts, release it, paper feeding stops. (If there is buzzer installed, then the buzzer will alarm during paper feeding.)

Handspike: hold down the handspike, the upper cover opened.

Power Indicator (RED): indicates the power status.

Status Indicator (GREEN): define as below:

Status	Definition
On	Online
Off	Offline
Flicker one time then turn off	Paper out
Flicker twice then turn off	Print head overheat

2.5 Self-test

The self-test can check the condition of printer, if the printer prints out the self-test receipt correctly, it means the printer works normally. Otherwise it needs to repair.

The self-test will print out the firmware version, interface setting and character set.

Holding down FEED button and turn on the power, then release the button, self-test begins automatically.

Chapter 3 Print Control Commands

3.1 Summary

POS58III offers ESC/POS print command sets.
Each command is described in following format:

Print Command		Function
Format:	ASCII:	the standard ASCII character sequence
	Decimal:	the decimal numbers sequence
	Hexadecimal:	the hexadecimal number sequence

Explanation: what the command does and how to use it.
Example: some examples are listed to illustrate the command for better understanding.

3.2 Command Specifications

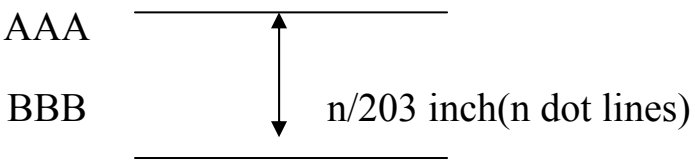
3.2.1 Character control commands

LF		Print and Feed Line
Format:	ASCII:	LF
	Decimal:	10
	Hexadecimal:	0A

Explanation:
Print the content in the buffer and feed paper one line. Only feed paper forwards one line if the buffer is empty.

ESC J				Print and Feed n Dot Lines
Format:	ASCII:	ESC	J	n
	Decimal:	27	74	n
	Hexadecimal:	1B	4A	n

Explanation:
Print the content in the buffer and feed paper n dot lines.(n/203 inch), n=0~255.
This command is only valid for current line and will not change the space settings that set by ESC 2，ESC 3 commands.
Example:



3.2.2 Line Space Setting Commands

ESC 2				Set Line Spacing to 1/6 Inch
Format:	ASCII:	ESC	2	

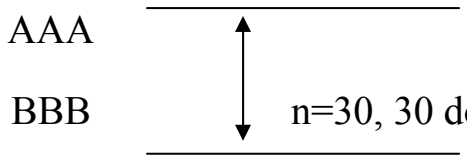
	Decimal:	27	50
	Hexadecimal:	1B	32

Explanation:
Set line spacing to 1/6 inch.

ESC 3 Set Line Spacing to n Dot Lines (n/203 inch)

Format:	ASCII：	ESC	3
	Decimal:	27	51
	Hexadecimal:	1B	33

Explanation:
Set line spacing to n dot lines. n=0~255.
One dot line is 1/203 inch for POS58III, this command sets the dot-line spacing to n/203 inch. Default n=30.
Example:

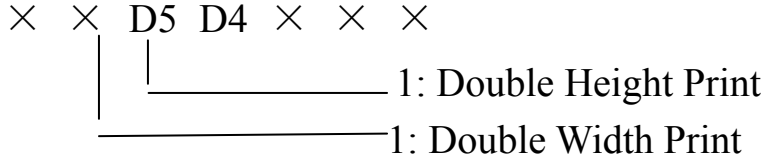


3.2.3 Character Print Commands

ESC ! Set Character Print Mode

Format:	ASCII:	ESC	!	n
	Decimal:	27	33	n
	Hexadecimal:	1B	21	n

Explanation:
ESC ! n is a comprehensive command to set character print mode, is used for selecting print character size. Each bit of print parameter n is defined:



Default n=0, that means no character enlargement.

ESC SO Set Double Width Character Print

Format:	ASCII:	ESC	SO
	Decimal:	27	14
	Hexadecimal:	1B	0E

Explanation:
All characters following this command on the same line are printed in double width, this command can be canceled by a carriage return or DC4 command.

ESC DC4 Cancel Double Width Character Print

Format:	ASCII:	ESC	DC4
	Decimal:	27	20
	Hexadecimal:	1B	14

Explanation:

After carrying out this command, the characters will be printed in normal width.

ESC % Select/Cancel User-defined Characters

Format:	ASCII:	ESC	%	n
	Decimal:	27	37	n
	Hexadecimal:	1B	25	n

Explanation:

When n=1, select user-defined character set; When n=0, select internal character set.

Default n=0

ESC & Define User-defined Characters

Format:	ASCII：	ESC	&	s	n	m	[a [p]s×a]m-n+1
	Decimal:	27	38	s	n	m	[a [p]s×a]m-n+1
	Hexadecimal:	1B	26	s	n	m	[a [p]s×a]m-n+1

Explanation:

ESC & is used to define user-defined characters. s=3，32≤n≤m≤126, 0≤a≤12, 0≤p≤255.

◆ s is the number of bytes in vertical direction, s=3 here.

◆ n is the starting ASCII code of user-defined character.

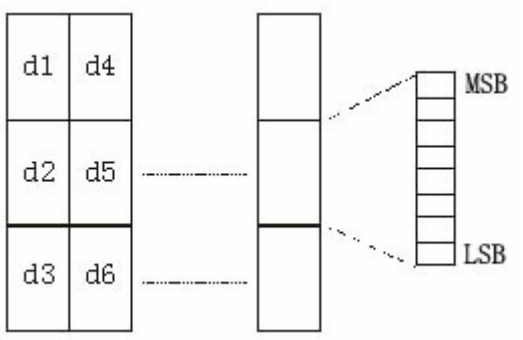
◆ m is the stopping ASCII code of user-defined character.

When define only one character, n=m, the maximum number of user-defined characters is 96.

◆ a is the number of dots in horizontal direction.

◆ p is the data of self-defined characters, there are s×a bytes for each character, the total number of user-defined characters is m-n+1.

◆ User-defined characters are valid until re-defined, reset or power off, format of the user-defined characters is shown as follows:



3.2.4 Special Control Commands

ESC c 5 Enable/Disable Switch Button Function

Format:	ASCII:	ESC	c	5	n
	Decimal:	27	99	53	n
	Hexadecimal:	1B	63	35	n

Explanation:

When n=1, button【LF】is enabled;

When n=0, button【FEED】is disabled;

Default n=0.

3.2.5 Graphics Print Commands

ESC * Set Bit-map Graphics

Format:	ASCII:	ESC	*	m	n1	n2	[d]k
	Decimal:	27	42	m	n1	n2	[d]k
	Hexadecimal:	1B	2A	m	n1	n2	[d]k

Explanation:

Select bit-map command, m is for setting bit-map mode; n1, n2 are for setting number of dots; [d]k is for setting contents of bit-map.

m=0,1,32,33, n1=0~3. d=0～255.

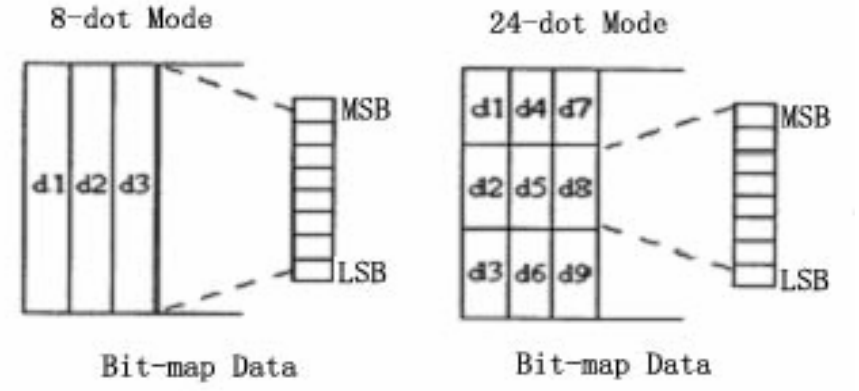
k=n1+256×n2 (m=0，1)

k=(n1+256×n2)×3 (m=32,33)

- ◆ The number of horizontal dots of the graphics is n1+256×n2
- ◆ If the number of dots is more than one line, the extra portion will be ignored (referring the following table)
- ◆ d is the bit map data, for 1 of bit means the related dot will be printed and for 0 of bit means the related dot will not be printed. (k is the total number of dot)
- ◆ m is the selected bit map mode.

M	Mode	Vertical	Horizontal		
		Dot	Density	Density	Max. Dots

0	8-dot single density	8	68DPI	101DPI	192
1	8-dot double density	8	68DPI	203DPI	384
32	24-dot single density	24	203DPI	101DPI	192
33	24-dot double density	24	203DPI	203DPI	384



GS / Print Download Bit-map Graphics

Format: ASCII： GS / n
Decimal: 29 47 n
Hexadecimal: 1D 2F n

Explanation:

This command is used to print download bit-map graphics. n=0～3

◆ n is used to select bit-map graphics mode.

◆ To define download bit-map graphics using GS * command:

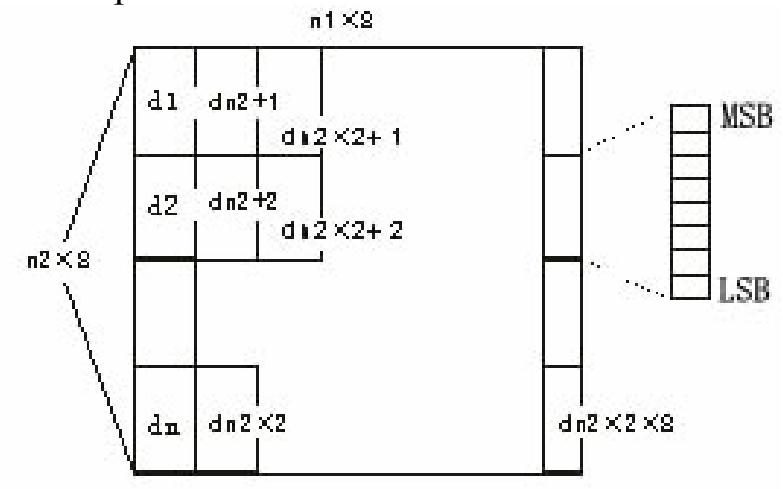
n	Bit-map mode	Vertical density	Horizontal density
0	Normal	203DPI	203DPI
1	Double width	203DPI	101DPI
2	Double height	101DPI	203DPI
3	Double height and double width	101DPI	101DPI

GS * Define download bit-map graphics

Format: ASCII: GS * n1 n2 [d]k
Decimal: 29 42 n1 n2 [d]k
Hexadecimal: 1D 2A n1 n2 [d]k

Explanation:
This command is used to define download bit-map graphics.
n1=1～48，n2=1～255，n1×n2<1200, k=n1×n2×8。

◆ d is the bit-map data.
◆ The horizontal size of this graphics is n1×8 dots, and vertical size is n2×8 dots.
◆ The definition is valid until re-define, power off or system reset. Format of the download bit-map data is shown as follows:



3.2.6 Bar Code Print

GS W Set bar code width

Format: ASCII: GS W n1 n2

Decimal:	29	87	n1	n2
Hexadecimal:	1D	57	n1	n2

Explanation:
n1: bar code narrow bar width, unit: dot. Each dot for POS58III printer is 1/203 inch or 0.125mm.
Default n1=3.
n2: bar code broad bar width

GS k — Print bar code

Format:	ASCII：	GS	k	n	［d］	NUL
	Decimal:	29	107	n	［d］	0
	Hexadecimal:	D	6B	n	［d］	00

Explanation:
n--- Select the printing bar code system:

n	Bar code
2	EAN-13
3	EAN-8

Pay attention to the specified character number of each bar code. EAN-13 and EAN-8 can generate parity characters automatically.
［d］is the printing bar code data.
NUL denotes GS K command is over，and carry out bar code print.

GS H — Select/cancel printing HRI characters

Format:	ASCII：	GS	H	n
	Decimal:	29	72	n
	Hexadecimal:	1D	48	n

Explanation:
n=0，don’t print HRI characters. Default n=0.
n=1，print HRI characters under bar code.

GS h — Set bar code height

Format:	ASCII：	GS	h	n
	Decimal:	29	104	n
	Hexadecimal:	1D	68	n

Explanation:
Set the height of printing bar code.
n=0～255, its unit is dot. When n=0, it is 256 dots.
Each dot for POS58III printer is 1/203 inch or 0.125mm.
Default n=60.

GS w Set bar code width

Format:	ASCII：	GS	w	n
	Decimal:	29	119	n
	Hexadecimal:	1D	77	n

Explanation:
Set the width of printing bar code.
n＝1～4. When n is different, the width of bar code will be different, as shows in the following tab:

n	Narrow size	Broad size
1	1	3
2	2	5
3	3	7
4	4	9

Its unit is dot. Each dot for POS58III is 1/203 inch or 0.125mm.
Default n=3.

3.2.7 Other Commands

ESC @ Initialize printer

Format:	ASCII：	ESC	@
	Decimal:	27	64
	Hexadecimal:	1B	40

Explanation:
ESC @ command is to initialize the following contents of the printer:
·Clear the data in the print buffer;
·Restore the default of each print command
·Select character print mode;
·Delete user-defined characters.

ESC p Cash Drawer control

Format:	ASCII：	ESC	p	m	nl	n2
	Decimal:	27	112	m	nl	n2
	Hexadecimal:	1B	70	m	nl	n2

Explanation:
This command is to generate a pulse to trigger the opening and closing of the cash drawer, n1, n2 define the duration of the trigger pulse.
m=0,0＜nl≤n2≤255。
Opening time is nl× 2ms, closing time is n2× 2ms.

ESC v Transmit Status of Printer

Format: ASCII ： ESC v
Decimal: 27 118
Hexadecimal: 1B 76

Explanation:
Send printer status to the host.
When printer received the command, it transfers one byte through TXD serial interface. Definition of said byte is shown as below:

Bit	Function	Value 0	Value 1
0	Undefined	———	———
1	Undefined	———	———
2	Paper tester	With paper	Without paper
3	Undefined	———	———
4	Not in use	0	0
5	Undefined	———	———
6	Undefined	———	———
7	Undefined	———	———

ESC u Transmit Status of Equipment

Format: ASCII： ESC u n
Decimal: 27 117 n
Hexadecimal: 1B 75 n

Explanation:
Send the peripheral equipment status to the host:
Default n=0
When printer received this command, it transmits one byte through TXD line of the serial interface to the host.

Bit	Function	Value 0	Value 1
0	Cash drawer on/off signal level	Low	High
1	Undefined	———	———
2	Undefined	———	———
3	Undefined	———	———
4	Not in use	0	———
5	Undefined	———	———

6	Undefined	———	———
7	Undefined	———	———

Appendix 1 Index of Print Commands

Command name	Command	Description
Print commands	LF	Print and feed line
	ESCJ	Print and feed n dot lines
Line spacing setting commands	ESC2	Set character line spacing to 1/6 inch
	ESC3	Set line spacing to n dot lines (n/203 inch)
Character print commands	ESC !	Set character print mode
	ESC SO	Set double width character print
	ESC DC4	Cancel double width character print
	ESC％	Select/Cancel User-defined Characters
	ESC&	Define user-defined characters
Special control commands	ESC c 5	On/Off switch Button function
Graphics print commands	ESC*	Print bit-map graphics
	GS /	Print download bit-map graphics
	GS *	Define download bit-map graphics
Bar code print commands	GS W	Set bar code width
	GS H	Select/cancel printing HRI characters
	GS h	Set bar code height
	GS k	Print bar code
	GS w	Set bar code horizontal size
Other commands	ESC @	Initialize printer
	ESCp	Cash drawer control
	ESCv	Transmit status of printer
	ESC u	Transmit status of equipment

Appendix 2 Index of Print Characters

十六进制	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2		!	”	#	$	%	&	’	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	
8	€	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	Æ	FE	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	₧	ƒ
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	⌐	¬	½	¼	¡	《	》
B	▒	▒	▓	|	┤	╡	╢	╖	╕	╣	‖	╗	╝	╜	┐
C	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	═	╬	╧
D	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	▉	▄	▌	▐	▀
E	α	β	Γ	π	Σ	σ	µ	τ	Φ	θ	Ω	δ	∞	φ	∈	∩
F	≡	±	≥	≤	⌠	⌡	÷	≈	◦	•	–	√	n	2	■	